Filipowicz, W., Hohn, T. (ed.): **Post-Transcriptional Control of Gene Expression in Plants.** - Kluwer Academic Publishers, Dordrecht - Boston - London 1996. ISNB 0-7923-42755. 414 pp., USD 227.50.

The book is dedicated to the memory of Hans Kösel (1934 - 1995) whose recent work on structure and function of chloroplast genomes culminated in the discovery of RNA editing in these organelles. This volume focuses on posttranscriptional processes and their regulation which is particularly important for generation of a fast response to environmental and intracellular signals.

The book is divided into five parts focusing on RNA processing and stability, translation, fate of translation products, regulation of gene expression in plant organelles, and special topics including gene expression mechanisms from viral RNA genes. The first section describes the processing of mRNA, *i.e.*, splicing and polyadenylation. Other chapters in this section are devoted to degradation of mRNA and to interesting mechanism of mRNA disposal which occurs during posttranscriptional silencing. Protein synthesis in eukaryotic cells, factors governing pretranslational processes, the initiation, the elongation, and their regulation are the topics of the second part. The action of chaperonins which play an important role in correct folding of many proteins, transport of protein to various subcellular localizations, unique property of plasmodesmata, and various proteolytic pathways in plants are summarized in the third part of the book. The following section is devoted to regulation of chloroplast and mitochondria gene expression which occurs mainly at the posttranscriptional level, *i.e.*, RNA *cis* and *trans* splicing, processing of polycistronic transcripts, and finally RNA editing. The last part is centred on the major strategies used by plant RNA viruses to produce the proteins required for virus multiplication, and gene expression in transgenic plants.

The book brings together contributions from excellent scientists reprinted from Plant Molecular Biology, Vol. 32 (1.2), 1996, with identical page numbering. The articles represent useful up-date reviews, however, readers must know molecular biology and genetics if they are to follow and retain the mass of material presented. Each chapter is furnished with a content, abstract, and list of references. For people working in the field of photosynthesis the book brings a different view on processes affecting the structure and function of photosynthetic apparatus. From this point of view, the most interesting articles are those including information on chloroplast specific systems. Chaperonins and foldases appear to play a prominent role in folding plastid protein such as light-harvesting complexes and ribulose-1,5-bisphosphate carboxylase/oxygenase (Boston *et al.*). Chapter on proteolysis (Vierstra) includes also protein degradation in chloroplasts, with respect to multi-subunit complexes, where proteolysis also assists in the inappropriate stoichiometry of subunits and in maintaining correct enzyme/cofactor ratios. Three chapters are focused on chloroplast genetic system. The mode of chloroplast gene expression exhibits several unique features not found in prokaryotic and eukaryotic nuclear systems, and operates at several steps such as transcription, posttranscription, translation, and posttranslation. Chloroplast RNA processing is probably the most important step in the control of chloroplast gene expression. Very little is known about splicing of chloroplast mRNA - this area of study presents one of the most interesting and challenging targets for further study (Sugita and Sugiura).

Analysis of nuclear mutants of *Chlamydomonas* has revealed that the interactions between nuclear and chloroplastic genetic systems are highly complex, and a suprisingly large number of nuclear loci are involved in the expression of chloroplast genes (Rochaix). The development of biolistic transformation system for tobacco chloroplasts provides a powerful tool for studying chloroplast gene expression *in vivo* (Maier *et al.*). There are some indications that RNA editing mechanisms of chloroplasts and mitochondria in spite of the similarities are not identical but must have at least some organelle-specific components.

In general, the chapters are well-written and provide a solid up-to-date summary of recent discoveries, and point out directions for future resesarch. A non-expert reader will have a hard time sorting all information. For example, there are at least three chapters on viral gene expression, but these are scattered throughout the book. Fortunately, a comprehensive subject index enables better orientation.

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